

WHAT IS CLAIMED IS:

1. A film comprising:

- a) a core layer comprising at least about 65 percent by weight of a homogeneous alpha-olefin/cyclic olefin random copolymer;
- b) a first outer layer comprising an olefinic polymer; and
- c) a second outer layer comprising an olefinic polymer;

wherein the film has:

- i) a Young's modulus of between about 50,000 pounds and about 200,000 pounds per square inch in at least one of the longitudinal and transverse directions;
- ii) a free shrink of between about 10% and about 80% at 240°F in at least one of the longitudinal and transverse directions; and
- iii) a shrink tension of less than about 400 pounds per square inch at 240°F in at least one of the longitudinal and transverse directions.

2. The film of claim 1 wherein the film has a haze of less than about 6.

3. The film of claim 1 wherein the homogeneous alpha-olefin/cyclic olefin random copolymer has a melt index of less than about 2 g/10 minutes.

4. The film of claim 1 wherein the core layer comprising a homogeneous alpha-olefin/cyclic olefin random copolymer comprises between about 30% and about 80% of the total film thickness.

5. The film of claim 1 wherein the homogeneous alpha-olefin/cyclic olefin random copolymer comprises a member selected from the group consisting of ethylene/norbornene copolymers and ethylene/cyclopentene copolymers.

6. The film of claim 5 wherein the homogeneous alpha-olefin/cyclic olefin random copolymer has a glass transition temperature of from about 25°C to about 45°C.

7. The film of claim 5 wherein the homogeneous alpha-olefin/cyclic olefin random copolymer comprises an ethylene/norbornene copolymer, the ethylene/norbornene copolymer comprising from about 15 mole percent to about 30 mole percent norbornene.

8. The film of claim 1 wherein each of the first outer layer and the second outer layer comprises a material selected from the group consisting of ethylene/alpha olefin copolymers, ethylene/vinyl acetate copolymers, ethylene/alkyl acrylate copolymers, ethylene/acrylic acid copolymers, ionomers, propylene homopolymers, propylene copolymers, propylene/ethylene copolymer, butylene homopolymers, butylene copolymers, low density polyethylenes, high density polyethylenes, multicomponent ethylene/alpha-olefin interpenetrating network resins, and blends thereof.

9. A film comprising:

- a) a core layer comprising at least about 65 percent by weight of a homogeneous alpha-olefin/cyclic olefin random copolymer;
- b) a first intermediate layer comprising an ethylene copolymer having a melt index less than about 2 g/10 minutes;

- c) a second intermediate layer comprising an ethylene copolymer having a melt index less than about 2 g/10 minutes;
- d) a first outer layer comprising an olefinic polymer; and
- e) a second outer layer comprising an olefinic polymer;

wherein the film has:

- i) a Young's modulus of between about 50,000 pounds and about 200,000 pounds per square inch in at least one of the longitudinal and transverse directions;
- ii) a free shrink of between about 10% and about 80% at 240°F in at least one of the longitudinal and transverse directions; and
- iii) a shrink tension of less than about 400 pounds per square inch at 240°F in at least one of the longitudinal and transverse directions.

10. The film of claim 9 wherein the film has a haze of less than about 6.

11. The film of claim 9 wherein the homogeneous alpha-olefin/cyclic olefin random copolymer has a melt index of less than about 2 g/10 minutes.

12. The film of claim 9 wherein the core layer comprising a homogeneous alpha-olefin/cyclic olefin random copolymer comprises between about 30% and about 80% of the total film thickness.

13. The film of claim 9 wherein the homogeneous alpha-

olefin/cyclic olefin random copolymer comprises a member selected from the group consisting of ethylene/norbornene copolymers and ethylene/cyclopentene copolymers.

14. The film of claim 13 wherein the homogeneous alpha-olefin/cyclic olefin random copolymer has a glass transition temperature of from about 25°C to about 45°C.

15. The film of claim 13 wherein the homogeneous alpha-olefin/cyclic olefin random copolymer comprises an ethylene/norbornene copolymer, the ethylene/norbornene copolymer comprising from about 15 mole percent to about 30 mole percent norbornene.

16. The film of claim 9 wherein each of the first intermediate layer and the second intermediate layer comprises a material selected from the group consisting of ethylene/alpha-olefin copolymers having a density of less than 0.916 grams/cubic centimeter, ethylene/vinyl acetate copolymers, ethylene/propylene/diene terpolymers, very low density polyethylenes, blends of very low density polyethylene and ethylene/vinyl acetate copolymer, and multicomponent ethylene/alpha-olefin interpenetrating net-work resins.

17. The film of claim 9 wherein each of the first outer layer and the second outer layer comprises a material selected from the group consisting of ethylene/alpha olefin copolymers, ethylene/vinyl acetate copolymers, ethylene/alkyl acrylate copolymers, ethylene/acrylic acid copolymers, ionomers, propylene homopolymers, propylene copolymers, propylene/ethylene copolymer, butylene homopolymers, butylene copolymers, low density polyethylenes, high density polyethylenes, multicomponent ethylene/alpha-olefin interpenetrating network resins, and blends

thereof.

18. A film comprising:

- a) a core layer comprising an ethylene copolymer having a melt index less than about 2;
- b) a first intermediate layer comprising at least about 65 percent by weight of a homogeneous alpha-olefin/cyclic olefin random copolymer;
- c) a second intermediate layer comprising at least about 65 percent by weight of a homogeneous alpha-olefin/cyclic olefin random copolymer;
- d) a first outer layer comprising an olefinic polymer; and
- e) a second outer layer comprising an olefinic polymer;

wherein the film has:

- i) a Young's modulus of between about 50,000 pounds and about 200,000 pounds per square inch in at least one of the longitudinal and transverse directions;
- ii) a free shrink of between about 10% and about 80% at 240°F in at least one of the longitudinal direction and transverse direction; and
- iii) a shrink tension of less than about 400 pounds per square inch at 240°F in at least one of the longitudinal and transverse directions.

19. The film of claim 18 wherein the film has a haze of less than about 6.

20. The film of claim 18 wherein the homogeneous alpha-

olefin/cyclic olefin random copolymer has a melt index of less than about 2 g/10 minutes.

21. The film of claim 18 wherein the core layer comprises a material selected from the group consisting of ethylene/alpha-olefin copolymers having a density of less than 0.916 grams/cubic centimeter, ethylene/vinyl acetate copolymers, ethylene/propylene/diene terpolymers, very low density polyethylenes, blends of very low density poly-ethylene and ethylene/vinyl acetate co-polymer, and multi-component ethylene/alpha-olefin interpenetrating network resins.

22. The film of claim 21 wherein the first and second intermediate layers together comprise between about 30% and about 80% of the total film thickness.

23. The film of claim 18 wherein the homogeneous alpha-olefin/cyclic olefin random copolymer comprises a member selected from the group consisting of ethylene/norbornene copolymers and ethylene/cyclopentene copolymers.

24. The film of claim 23 wherein the homogeneous alpha-olefin/cyclic olefin random copolymer has a glass transition temperature of from about 25°C to about 45°C.

25. The film of claim 23 wherein the homogeneous alpha-olefin/cyclic olefin random copolymer comprises an ethylene/norbornene copolymer, the ethylene/norbornene copolymer comprising from about 15 mole percent to about 30 mole percent norbornene.

26. A film comprising:

a) a core layer comprising a homogeneous alpha-

olefin/cyclic olefin random copolymer having a glass transition temperature of from about 25°C to about 45°C.;

- b) a first outer layer comprising an olefinic polymer; and
- c) a second outer layer comprising an olefinic polymer;

wherein the film has:

- ii) a Young's modulus of between about 50,000 pounds and about 200,000 pounds per square inch in at least one of the longitudinal and transverse directions;
- ii) a free shrink of between about 10% and about 80% at 240°F in at least one of the longitudinal and transverse directions; and
- iii) a shrink tension of less than about 400 pounds per square inch at 240°F in at least one of the longitudinal and transverse directions.

27. The film of claim 26 wherein the film has a haze of less than about 6.

28. The film of claim 26 wherein the homogeneous alpha-olefin/cyclic olefin random copolymer has a melt index of less than about 2 g/10 minutes.

29. The film of claim 26 wherein the core layer comprising a homogeneous alpha-olefin/cyclic olefin random copolymer comprises between about 30% and about 80% of the total film thickness.

30. The film of claim 26 wherein the homogeneous alpha-

olefin/cyclic olefin random copolymer comprises a member selected from the group consisting of ethylene/norbornene copolymers and ethylene/cyclopentene copolymers.

31. The film of claim 30 wherein the homogeneous alpha-olefin/cyclic olefin random copolymer comprises an ethylene/norbornene copolymer, the ethylene/norbornene copolymer comprising from about 15 mole percent to about 30 mole percent norbornene.

32. The film of claim 26 wherein each of the first outer layer and the second outer layer comprises a material selected from the group consisting of ethylene/alpha olefin copolymers, ethylene/vinyl acetate copolymers, ethylene/alkyl acrylate copolymers, ethylene/acrylic acid copolymers, ionomers, propylene homopolymers, propylene copolymers, butylene homopolymers, butylene copolymers, low density polyethylenes, high density polyethylenes, multicomponent ethylene/alpha-olefin interpenetrating network resins, blends of a propylene homopolymer and a propylene/ethylene copolymer, blends of high density polyethylene and ethylene/vinyl acetate copolymer, and blends of high density polyethylene and low density polyethylene.

33. A film comprising:

- a) a core layer comprising a homogeneous alpha-olefin/cyclic olefin random copolymer having a glass transition temperature of from about 25°C to about 45°C;
- b) a first intermediate layer comprising an ethylene copolymer having a melt index less than about 2;
- c) a second intermediate layer comprising an ethylene copolymer having a melt index less than about 2;



- d) a first outer layer comprising an olefinic polymer; and
- e) a second outer layer comprising an olefinic polymer;

wherein the film has:

- i) a Young's modulus of between about 50,000 pounds and about 200,000 pounds per square inch in at least one of the longitudinal and transverse directions;
- ii) a free shrink of between about 10% and about 80% at 240°F in at least one of the longitudinal and transverse directions; and
- iii) a shrink tension of less than about 400 pounds per square inch at 240°F in at least one of the longitudinal and transverse directions.

34. The film of claim 33 wherein the film has a haze of less than about 6.

35. The film of claim 33 wherein the homogeneous alpha-olefin/cyclic olefin random copolymer has a melt index of less than about 2 g/10 minutes.

36. The film of claim 33 wherein the core layer comprising a homogeneous alpha-olefin/cyclic olefin random copolymer comprises between about 30% and about 80% of the total film thickness.

37. The film of claim 33 wherein the homogeneous alpha-olefin/cyclic olefin random copolymer comprises a member selected from the group consisting of ethylene/norbornene copolymers and

ethylene/cyclopentene copolymers.

38. The film of claim 37 wherein the homogeneous alpha-olefin/cyclic olefin random copolymer comprises an ethylene/norbornene copolymer, the ethylene/norbornene copolymer comprising from about 15 mole percent to about 30 mole percent norbornene.

39. The film of claim 33 wherein each of the first intermediate layer and the second intermediate layer comprises a material selected from the group consisting of ethylene/alpha-olefin copolymers having a density of less than 0.916 grams/cubic centimeter, ethylene/vinyl acetate copolymers, ethylene/propylene/diene terpolymers, very low density polyethylenes, blends of very low density polyethylene and ethylene/vinyl acetate co-polymer, and multicomponent ethylene/alpha-olefin interpenetrating net-work resins.

40. The film of claim 33 wherein each of the first outer layer and the second outer layer comprises a material selected from the group consisting of ethylene/alpha olefin copolymers, ethylene/vinyl acetate copolymers, ethylene/ alkyl acrylate copolymers, ethylene/acrylic acid copolymers, ionomers, propylene homopolymers, propylene copolymers, butylene homopolymers, butylene copolymers, low density polyethylenes, high density polyethylenes, multicomponent ethylene/alpha-olefin interpenetrating network resins, blends of a propylene homopolymer and a propylene/ethylene copolymer, blends of high density polyethylene and ethylene/vinyl acetate copolymer, and blends of high density polyethylene and low density polyethylene.

41. A film comprising:

a) a core layer comprising an ethylene copolymer

having a melt index less than about 2;

- b) a first intermediate layer comprising a homogeneous alpha-olefin/cyclic olefin random copolymer having a glass transition temperature of from about 25°C to about 45°C;
- c) a second intermediate layer comprising a homogeneous alpha-olefin/cyclic olefin random copolymer having a glass transition temperature of from about 25°C to about 45°C;
- d) a first outer layer comprising an olefinic polymer; and
- e) a second outer layer comprising an olefinic polymer;

wherein the film has:

- i) a Young's modulus of between about 50,000 pounds and about 200,000 pounds per square inch in at least one of the longitudinal and transverse directions;
- ii) a free shrink of between about 10% and about 80% at 240°F in at least one of the longitudinal direction and transverse direction; and
- iii) a shrink tension of less than about 400 pounds per square inch at 240°F in at least one of the longitudinal and transverse directions.

42. The film of claim 41 wherein the film has a haze of less than about 6.

43. The film of claim 41 wherein the homogeneous alpha-olefin/cyclic olefin random copolymer has a melt index of less than about 2 g/10 minutes.

44. The film of claim 41 wherein the core layer comprises a material selected from the group consisting of ethylene/alpha-olefin copolymers having a density of less than 0.916 grams/cubic centimeter, ethylene/vinyl acetate copolymers, ethylene/propylene/diene terpolymers, very low density polyethylenes, blends of very low density poly-ethylene and ethylene/vinyl acetate co-polymer, and multi-component ethylene/alpha-olefin interpenetrating network resins.

45. The film of claim 44 wherein the first and second intermediate layers together comprise between about 30% and about 80% of the total film thickness.

46. The film of claim 41 wherein the homogeneous alpha-olefin/cyclic olefin random copolymer comprises a member selected from the group consisting of ethylene/norbornene copolymers and ethylene/cyclopentene copolymers.

47. The film of claim 46 wherein the homogeneous alpha-olefin/cyclic olefin random copolymer comprises an ethylene/norbornene copolymer, the ethylene/norbornene copolymer comprising from about 15 mole percent to about 30 mole percent norbornene.